

REMARKS

Claims 1-20 are pending in the application. By this Amendment, claim 1 has been amended to correct informalities. Specifically, a dash has been removed between the claim features “two” and “propellant.” Further, claim 1 has been amended to recite “the charge” instead of “he charge.” No new matter has been added by this response.

Entry of the claim amendment is respectfully requested because the amendment is de minimis and does not require any further search.

Claims 1-20 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 694,295 to Maxim in view of U.S. Patent Application Publication No. 2005/0066835 to Hafstrand.

As appreciated by the Examiner, Maxim fails to suggest features that can reasonably be considered to correspond to a combustion of the propellant tubes is partially mutually overlapping, as recited in independent claim 1. The Office Action relies on Hafstrand for curing the deficiencies of Maxim.

By way of non-limiting example, Fig. 6 of Applicants’ disclosure shows a general pressure/time graph for a charge illustrating the claim feature of a combustion that is partially mutually overlapping. As can be seen from Fig. 6, the pressure P_{optimal} within the barrel remains nearly constant in the plateau region. Importantly, the partially mutually overlapping pressure contributions from propellant tubes 10, 11, and 12 result in a total pressure that is nearly constant because, as set forth on 18, lines 14-32, an decrease in pressure from one propellant tube is compensated by the addition of propellant gas generated from the next propellant tube.

Consequently, as set forth at page 3, lines 32-34, it is possible with the claimed subject matter to increase the performance of older artillery pieces with up-to-date ammunition without exceeding the maximum permissible barrel pressure P_{max} .

Maxim, at page 1, lines 45-48, suggests concentrically arranged tubes to form a charge adapted to secure progressive combustion. Maxim fails to suggest that combustion of the tubes results in a constant or nearly constant pressure over any period of time while the projectile is traveling through the barrel. Specifically, Maxim fails to suggest that an increase in pressure resulting from the combustion of a later ignited tube compensates the decrease in pressure resulting from the burning up of an earlier ignited tube. Thus, Maxim fails to suggest features that can reasonably be considered to correspond to the above-quoted feature of claim 1.

The Office Action relies on Hafstrand for suggesting surface-treated powders. Hafstrand teaches, at paragraph [0007], a method of producing progressive propellants powder charges with a higher degree of filling or loading density. As set forth in paragraph [0004] of Hafstrand, the progressivity of powder can be accentuated by surface treatment. In particular, Hafstrand teaches a progressive propellant made of a finely grained and a coarser-grained powder

Hafstrand, however, does not suggest that one powder compensates in pressure a decrease in pressure resulting from the burning up of the other powder. As such, Hafstrand cannot reasonably be considered to teach the above-quoted feature of claim 1.

Accordingly, Maxim and Hafstrand, alone or in any permissible combination, fail to suggest the combination of all of the features of independent claim 1.

In view of the above amendment, Applicants believe the pending application is in condition for allowance.

Applicants concurrently herewith submit the requisite fee for a Petition for a two-month Extension of Time. Applicants believe no additional fee is due with this response. However, if any such additional fee is due, please charge our Deposit Account No. 22-0185, under Order No. 20459-00400-US1 from which the undersigned is authorized to draw.

Dated: June 12, 2009

Respectfully submitted,

Electronic signature: /Georg M. Hasselmann/
Georg M. Hasselmann

Registration No.: 62,324
CONNOLLY BOVE LODGE & HUTZ LLP
1875 Eye Street, NW
Suite 1100
Washington, DC 20006
(202) 331-7111
(202) 293-6229 (Fax)
Attorney for Applicant